

TOMS OZONE DATA COMPARED AT MESOSCALE RESOLUTION  
TO TROPOPAUSE HEIGHTS FROM THE AVE RADIOSONDE NETWORK  
AND TO VAS RADIANCES OVER THE SOUTH-CENTRAL UNITED STATES

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In the spring of 1982, an Atmospheric Variability Experiment (AVE) radiosonde network was operated at three hour intervals over the south-central United States, synchronized with observations from the VISSR Atmospheric Sounder (VAS) on the GOES satellite. The Total Ozone Mapping Spectrometer (TOMS) dataset from the Nimbus satellite overpass at 1700 GMT nearly coincides with the AVE/VAS observations at 1800 GMT during these experiments.

The observations on March 6, 1982 are being used to intercompare TOMS, AVE and VAS data with space-time registration errors less than 50 km and 1 hr under moderately baroclinic conditions across Texas-Oklahoma. The TOMS data shows a significant ozone maximum over northeastern Texas. The AVE radiosonde analysis shows tropopause heights with the highest pressures (lowest altitudes) over central Oklahoma accompanied by a mid-level jet across northern Mexico exiting above the Texas-Gulf Coast. The corresponding VAS radiances show a dry slot in the middle tropopause across central Texas accompanied by a secondary slot over Oklahoma. The various maxima are separated by approximately 100 to 500 km, observed with resolutions ranging from 15 to 50 km. The separations are not yet known exactly since the preliminary tropopause heights are not yet calculated objectively and corrected for balloon drift or field motion between 1700 and 1800 GMT.

Because TOMS ozone data provides information near the tropopause (a level where VAS infrared channels have very poor signal/noise and vertical resolution), TOMS is potentially useful in remote soundings. The impact of TOMS data is being assessed within a regression algorithm by comparing AVE radiosonde observations to corresponding VAS-only, TOMS-only and VAS+TOMS upper air retrievals. Preliminary results indicate no significant impact near the tropopause because TOMS ozone data is not registered (and appears statistically uncorrelated) with respect to AVE tropopause heights. After the March 6 datasets are re-analyzed and motion-corrected, the impact study will be repeated. TOMS data may require interpretation with a dynamical model before use in a mesoscale retrieval algorithm.